

CLAIMS

What is claimed is:

1. A method of removing counterions from a salt compound in a solution, comprising contacting the compound in solution with an appropriate ion exchange medium, and separating the solution containing the compound from the ion exchange medium.
2. The method of claim 1 wherein the counterion is a cation, and the ion exchange medium is an anionic resin.
3. The method of claim 1 wherein the counterion is an anion, and the ion exchange medium is a cationic resin.
4. The method of claim 1 wherein the compound is a synthetic amino acid analog.
5. The method of claim 4 wherein the synthetic amino acid analog includes an amidine functional group.
6. The method of claim 5 wherein the synthetic amino acid analog is selected from the group consisting of *S*-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine, dihydrochloride; *S*-[2-(ethanimidoylamino)-1-methylethyl]cysteine; (2*S*,5*E*)-2-amino-6-fluoro-7-[(1-iminoethyl)amino]-5-heptenoic acid, dihydrochloride; (*S*, *E*)-2-amino-2-methyl-6-[(1-iminoethyl)amino]-4-hexenoic acid, dihydrochloride; (2*S*,5*Z*)-2-amino-2-methyl-7-[(1-iminoethyl)amino]-5-heptenoic acid, dihydrochloride; and (2*S*,5*E*)-2-amino-2-methyl-6-fluoro-7-[(1-iminoethyl)amino]-5-heptenoic acid, dihydrochloride.
7. The method of claim 2 wherein the cationic counterion is a mineral acid, an organic acid, or a mixture of a mineral acid and an organic acid.
8. The method of claim 1 wherein the method is performed with ion exchange resin in a single stirred vessel.

9. The method of claim 1 wherein the method is performed with ion exchange resin in several batches in a plurality of stirred vessels in series, with intermediate filtering of the resin and replacement with fresh resin.
10. The method of claim 1 wherein the method is performed with ion exchange resin where the solution is passed through a resin bed contained within a column.
11. The method of claim 1 wherein the method is performed with an ion exchange membrane.
12. S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine zwitterion having from between zero and up to two molar equivalents of a cationic counterion.
13. S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine zwitterion with between zero and up to 2 molar equivalents of hydrochloride.
14. A method of making S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine zwitterion characterized by stoichiometrically less than 0.5 equivalents of hydrochloride ion to S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine comprising:
obtaining a source of S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine dihydrochloride, and removing sufficient hydrochloric acid to obtain the S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine zwitterion having stoichiometrically less than 0.5 equivalents of hydrochloride ion to S-[2-[(1-Iminoethyl)amino]ethyl]-2-methyl-L-cysteine.
15. The method of claim 14 wherein the hydrochloric acid is removed by a resin in a column.